Marl Lake
Resource Management Area

Background Information

Ontario
Ministry of
Natural
Resources
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Minister

MARL LAKE

RESOURCE MANAGEMENT AREA

BACKGROUND INFORMATION

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1. Introduction

This resource management planning document has been designed to achieve three goals. It presents, in summarized form, descriptive information, regarding the nature and significance of the geophysical, biological and cultural resources of the Marl Lake Resource Management Area.

It provides targets for the production of renewable resources and the utilization of recreation opportunities.

Finally, it outlines a range of optional management strategies (3) one of which will form the basis of a preliminary management plan.

The process of developing a management plan for the Marl Lake Resource Management Area began with preparation and distribution of an Issues Discussion Paper in August, 1989. It was sent to adjacent landowners, municipalities, government agencies and interest groups and those receiving it were encouraged to review it and to forward comments to the Huronia District Office, Ministry of Natural Resources. The paper briefly identified six major issues requiring examination and resolution during the plan development process. Information presented in this current document will be useful in dealing with the issues.

The Marl Lake wetlands were systematically studied in 1984 as part of a provincial wetland evaluation program. As a result the area was identified as a Class One wetland due in part to the presence of a number of significant biological features.[1] Since, the initial evaluation a program for securing and managing Provincially significant wetlands containing important wildlife habitats has been put in place.

The program provides for purchase of the following: Class One and Two wetlands; wetland staging areas of strategic importance to waterfowl; wetlands containing resources identified under the ANSI program (Areas of Natural and Scientific Interest); and habitat of endangered wildlife. The program is supported by agreements with the Ministry of Natural Resources, Ducks Unlimited Canada[2] and Wildlife Habitat Canada.[3] Funds generated by Wildlife Habitat Canada were used to acquire the 174 ha which make up the area, in 1987.

The program also provides for co-operative management of waterfowl habitat under the following goal, to "manage waterfowl habitat to perpetuate and increase waterfowl and other wetland-dependent wildlife."[4] Under this goal two objectives have been set out:

1. Maintain, restore and create waterfowl habitat.
2. Enhance opportunities for public use and enjoyment of the waterfowl resource.

These objectives will be achieved through a co-operative effort between the Ministry of Natural Resources and Ducks Unlimited Canada. Seven guiding strategies for co-operative management have been set out in an agreement.

In 1988, the study area was surveyed as part of a biological inventory of Wasaga Beach Provincial Park and adjacent areas. A purpose of the study, was to re-evaluate the over-all significance of the biological features of the Park and nearby areas and confirm or alter the conclusions of previous inventory studies conducted in 1975, 1981 and 1984. Previous findings were reconfirmed. In addition it recommended that a large portion of the Marl Lake Study Area be given status as a provincially significant Area of Natural and Scientific Interest (ANSI).[5]

Findings of the 1984 wetland evaluation and the 1988 botanical inventory provide a large body of information, drawn upon during preparation of this report. These and additional references used are listed in the References.

2. Regional Context

The study area is situated within south central Ontario, a region bounded by Lake Ontario to the south, the Niagara Escarpment to the west, Georgian Bay and the Precambrian Shield to the north and Trent-Severn Waterway or Lake Simcoe-Couchiching to the east.

The entire region is within the Great Lakes drainage basin and water from the study area drains into the Georgian Bay of Lake Huron via the Nottawasaga River.

Marl Lake occupies a portion of the Simcoe Lowlands regional physiographic unit which was inundated in post glacial times by lakes Algonquin and, to a lesser degree, Nipissing. The lowlands cover a large portion of present day Simcoe County and are covered by soils dominated by sands, silts, clays and organics. In many areas such as Marl Lake, drainage is poor however where soils and moisture conditions allow, agriculture is the dominant land use.

Vegetation patterns and communities vary across the region in response to landform, soil, moisture and climate conditions. Marl Lake is situated in a poorly drained depression and vegetation communities consist largely of swamp and marsh types except where soils are drier and land was cleared for agriculture.

Rapid population growth is occurring throughout the region which currently holds in excess of 50 percent of the province's total population. The City of Barrie and the Towns of Collingwood and Wasaga Beach are experiencing the effects of this growth phenomenon. As an example land immediately north of Marl Lake is the site of a 170 lot residential subdivision currently under development. The south Georgian Bay area has long been a popular area for cottaging and outdoor recreation and its popularity has increased in tandem with the growth of the urban centres bordering Lake Ontario. Within the last five years a rapid increase in resort condominium construction has occurred and it has been estimated that 75% of the provincial supply of such units are within the south Georgian Bay area (Meaford to Wasaga Beach). Increasingly, cottages are being converted for year round use and new single family residential construction is largely for permanent or year round occupation. While the south central Ontario region is heavily industrialized, the Town of Wasaga Beach currently has no industrial tax base.

2.2 Location

Marl Lake is situated in the north west quarter of the County of Simcoe within the limits of the Town of Wasaga Beach. Specifically it consists of all of Lot 24, part of lot 25 in Concession Seven and part of Lot 24 in Concession Eight. This area was formerly part of the Township of Flos until 1974 when the Town of Wasaga Beach was established.

2.3 Access

Provincial, county and municipal road systems in south central Ontario are highly developed and well maintained. Two Provincial highways provide access to Wasaga Beach and vicinity; Highway 92 to the north and east connecting Wasaga Beach and Elmvale and Highway 26 to the south connecting Barrie, Stayner and Collingwood. Local roads maintained by the Town of Wasaga Beach and the Township of Flos provide access between the Provincial highways and Marl Lake. From the north, Golf Course Road provides access directly to a local service road. This road is only partially improved and currently serves one residence. Half of the distance between Golf Course Road and the lake is passable only on foot. Access from Highway 26 is provided via Township of Flos Side Road 25/26 and Concession Road Six-Seven (Ryther Road). A portion of the latter, which forms the south boundary of the study area, east of Sideroad 25/26 is an unimproved road passable on foot or with special purpose vehicle (4 x 4's or ATV). To the west it connects with Golf Course Road.

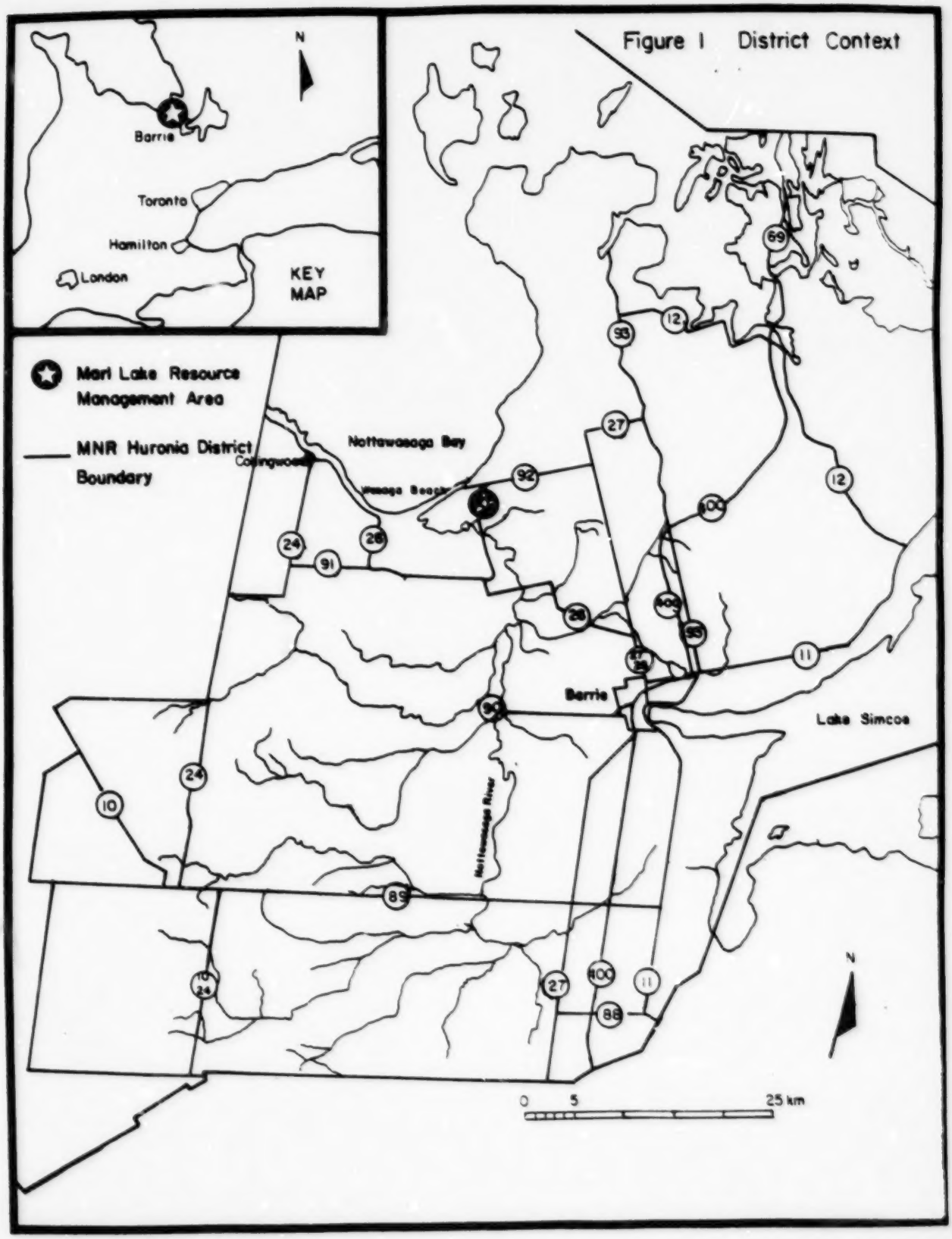


Figure 1 District Context
N
Barrie
Toronto
Hamilton
London
KEY MAP
Mari Lake Resource Management Area
MNR Huronia District Boundary
Nottawasaga Bay
Collingwood
Barrie
Lake Simcoe
Nottawasaga River
0 5 25 km
N

2.4 Population Centres

The closest population centre is Wasaga Beach with a year round population of 4807. This figure represents approximately 30 percent of the combined permanent and seasonal population of 16,000. The other centres within 50 km of Marl Lake and their populations are as follows:

Centre	Population*	Distance (km) from Marl Lake
Barrie	49,818	34
Collingwood	12,196	24
Alliston	4,885	50
Midland	13,171	37
Penetanguishene	5,533	42
Port McNicoll	1,818	41
Victoria Harbour	1,080	49
Thornbury	1,458	47
Stayner	3,045	18
Wasaga Beach	4,807	
Elmvale	1,564	15

* Source: 1988 Ontario Municipal Directory

3 Planning Area

3.1 Acquisition and Legal Status

The 174 ha which make up the study area were acquired in 1987 from three landowners. Legal title to the property is now held by the Ontario Ministry of Government Services. The area is currently classified, for administrative purposes, as public land and regulations under the Public Lands Act (Revised Statutes of Ontario 1980), administered by the Ministry of Natural Resources, apply.

3.2 Other Public Agency Involvement

3.2.1 Ontario Ministry of the Environment

This ministry is responsible for administering three Acts, which will/may apply to future activities in the study area. The first is the Environmental Assessment Act. It requires among others that the potential impacts of a project/program on all elements of the environment be identified together with ways in which any undesirable impacts may be reduced or eliminated. It also requires that adequate time and other resources be provided for public involvement in decision making processes. While the process of developing a management plan provides opportunities for public input it can only partially fulfil the requirements of the Environmental Assessment Act and its regulations. Implementation of some projects which may be provided for in the management plan must be preceded by one of the following: (i) Preparation of an Environmental Assessment statement or (ii) satisfying the requirements of specific class Environmental Assessments which have been put in place for a number of types/classes of projects (e.g. dams and dykes).

The second Act is the Ontario Water Resources Act. Through it, the Ministry of the Environment regulates activities which have potential to affect flows within water courses. A water taking permit system is the mechanism used. This system is usually applied to water courses crossing private land. In the case of the Marl Lake study area it could be used to ensure that flows entering the wetland are not interfered with. (Note: On public lands such as those in the study area, water quantity regulation is provided for in the Public Lands Act - As Revised, administered by the Ontario Ministry of Natural Resources).

The third Act is the Environmental Protection Act. It provides regulations including penalties designed to prevent pollution of air and water. In the case of Marl Lake it would apply to water quality. Managers would be required to ensure that the quality of water within the wetland as well as downstream from it does not deteriorate as a result of any management programs/activities.

3.2.2 Ontario Ministry of Agriculture and Food

The mandate of this ministry deals with among others, the protection of productive agricultural lands and with crop production. In addition it is involved in administration of the Drainage Act.

Agricultural crop production on lands adjacent to wetlands may be affected by waterfowl or other bird populations attracted to these areas. Cultivated fields often provide valuable nesting habitat or food sources depending upon the season and type of crop being grown. Providing benefits to waterfowl <u>may</u> be incompatible with agricultural production objectives however, in many cases crop management programs can be designed and implemented to provide for crop production and waterfowl habitat requirements. The Ministry of Agriculture and Food may be involved in providing technical advice for designing cropping programs.

The Drainage Act provides for the funding of drainage improvement works such as those described in section 4.2.5.1 which have affected Marl Lake water levels. Provincial funds are distributed to municipalities who, in turn, assist landowners in financing projects.

3.2.3 Nottawasaga Valley Conservation Authority (NVCA)

This public agency's primary responsibility is to provide for water management within the Nottawasaga River watershed. Under the Conservation Authorities Act, it may prepare and enforce regulations to help in achieving its primary water management objective; flood control. Currently, no such regulations have been prepared for the Marl Lake/Marl Creek portion of the watershed.

The authority has other objectives and programs related to water management including erosion control, reforestation, recreation and public education.

3.2.4 Town of Wasaga Beach

This local municipality, through its departments, administers programs which provide various services and regulatory controls some of which directly affect the study area. Services provided include maintenance of local roads (see section 2.3), solid waste management, water treatment and distribution, sewage treatment and fire suppression.

Regulatory controls include those relating to land use and zoning (see following section), residential and commercial construction and public safety.

A by-law prohibiting the discharge of firearms within the municipality is enforced by municipal staff. This has had an impact upon hunting, a traditional activity in the study area. (See section 3.4).

3.3 Land Use and Municipal Land Use Planning Policies

3.3.1 Current Land Use

Changes are occurring in the pattern of land use in the vicinity of the study area. The most significant of these involves development of a 170 lot residential subdivision. It occupies a portion of the Marlwood Golf Course (formerly Wasaga Beach Golf and Country Club) and an adjacent forested area along the south side of Golf Course Road. Re-design of half of the golf course has occurred simultaneously. A second subdivision will provide for development of 280 condominiums and a 45 room hotel as well as redesign/reconstruction of the remainder of the golf course. Both of these residential developments will be serviced by municipal water supply and sewage treatment.

Other land uses occurring around the study area are agriculture and low intensity forestry.

3.3.2 Municipal Planning and Zoning Policies

The Official Plan for the Town of Wasaga Beach Planning Area was approved in 1978 and a major amendment to it (No. 9) came into effect in 1987. The plan provides for the combined permanent and seasonal population of the town to grow more than 130 percent (15,000 to 35,000) between 1978 and the end of the planning period, 2000. That portion of the town containing Marl Lake is to receive the largest percentage population increase.[7]

Under the Official Plan the environmental protection and rural landuse designations apply to the Marl Lake Resource Management Area with the former designation applying to all but two relatively small areas in the southwest and southeast portions of the study area.

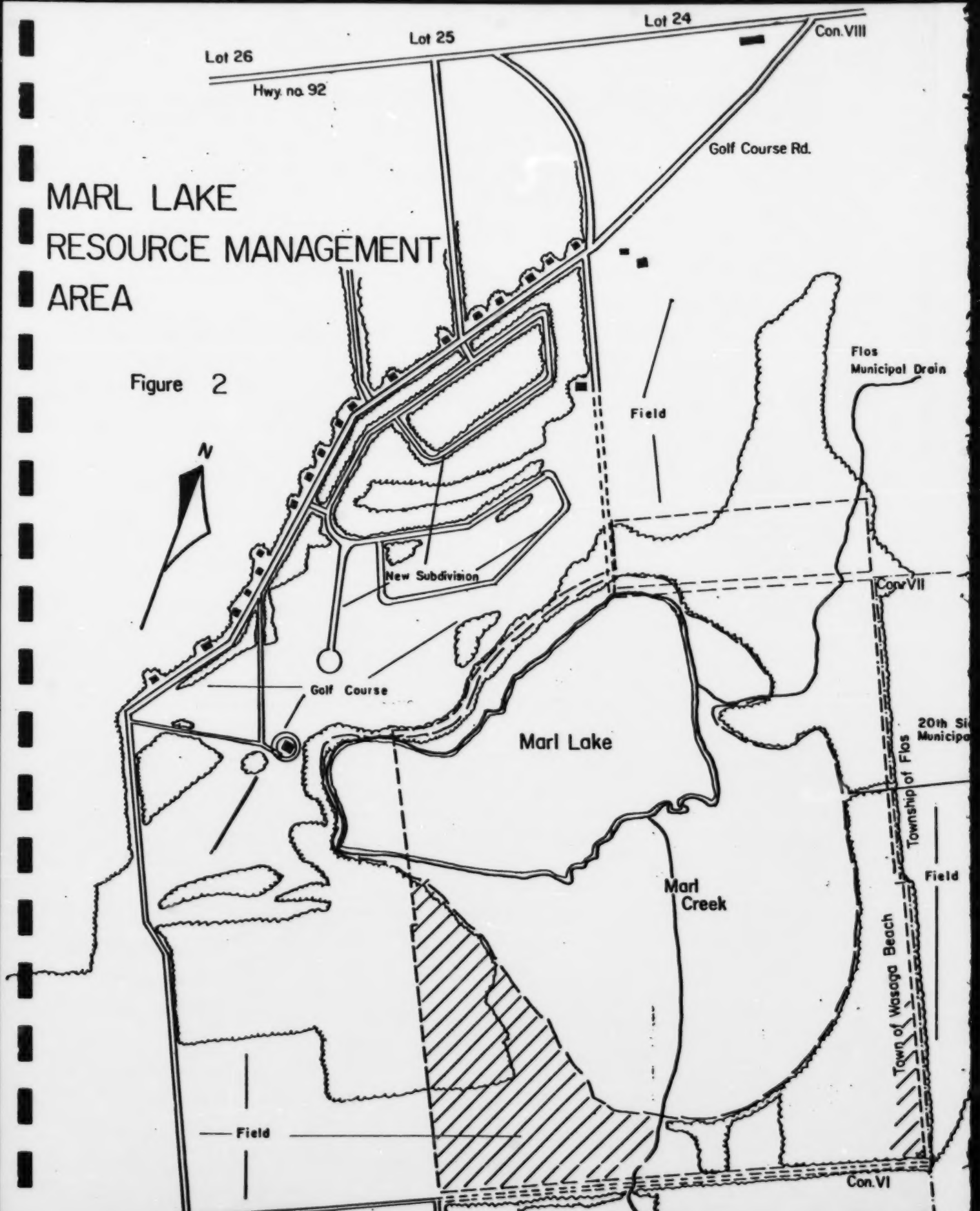
The environmental protection designation is intended to provide for the preservation and conservation of the natural environment and these areas are to be protected from undesirable forms of development. Public acquisition is to be encouraged when practical.

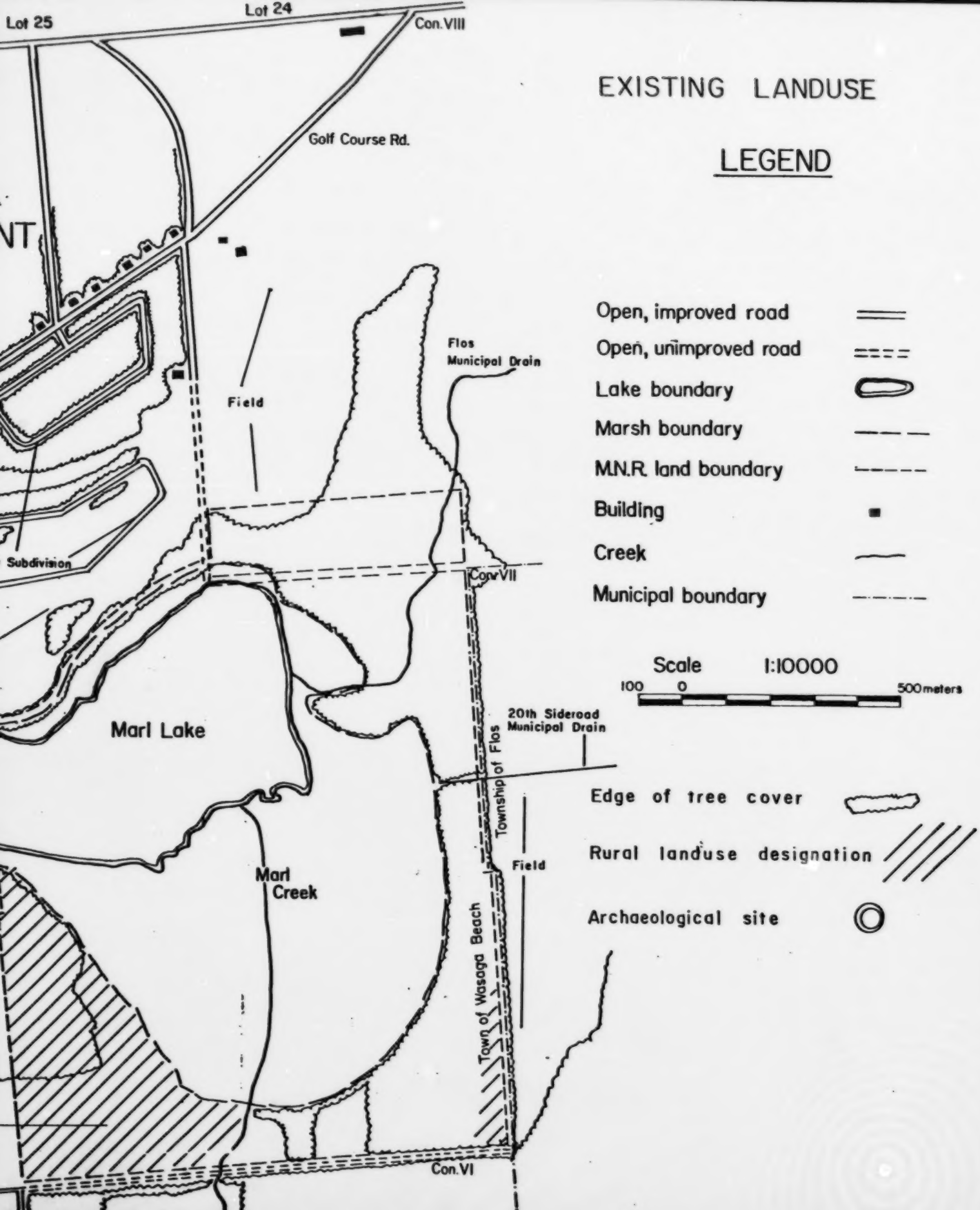
The rural designation has, among other objectives, that of promoting recreational use of land where agricultural operations are not feasible or viable. All lands adjacent to the property carry either one or the other of the above landuse designations. Land to the east is subject to the policies of the Official Plan for the Township of Flos and are designated as Hazard and Rural.[8]

Under the Town's Restricted Area Zoning By-Law, 75-10, two zones apply to the Marl Lake Resource Management Area; Environmental Protection and Rural. Relevant land uses permitted in the Environmental Protection zone include agriculture, forestry, golf courses, parking lots, marine facilities and public (recreational) uses. Within the Rural zone permitted uses include farms (including specialized farms), farm produce sales outlets, forestry uses, in-home businesses and public uses.[9] All of the above are considered to be consistent with the range of resource management programs under consideration for the study area.

3.4 Past and Current Uses

Despite the fact that the study area was entirely privately owned prior to 1987, various forms of recreational activity occurred. In addition the south west portion of the area was used for agricultural crop production. Crops grown included forage crops, and grains.


MARL LAKE
RESOURCE MANAGEMENT
AREA
Figure 2
Lot 24
Lot 25
Lot 26
Con. VIII
Hwy. no. 92
Golf Course Rd.
Flos
Municipal Drain
Field
N
New Subdivision
Con. VII
Golf Course
Marl Lake
20th Si
Municipa
Township of Flos
Field
Marl
Creek
Town of Wasaga Beach
Field
Con. VI


Lot 25
Lot 24
Con. VIII
Golf Course Rd.
NT
Field
Flos
Municipal Drain
Subdivision
Con. VII
Marl Lake
20th Sideroad
Municipal Drain
Township of Flos
Field
Marl
Creek
Town of Wasaga Beach
Con. VI
EXISTING LANDUSE
LEGEND
Open, improved road
Open, unimproved road
Lake boundary
Marsh boundary
M.N.R. land boundary
Building
Creek
Municipal boundary
Scale 1:10000
100 0 500 meters
Edge of tree cover
Rural landuse designation
Archaeological site

Recreational activities included hunting, fishing, nature appreciation, hiking and other trail based recreational activity. Waterfowl, upland small game and deer were all hunted in and adjacent to the study area prior to the municipal boundary re-organization (1974) and the subsequent implementation of a noise control by-law and a related by-law restricting the discharge of firearms. Documented existence of waterfowl hunting blinds in the marsh and reports from local residents indicate that waterfowl hunting was a traditional activity.

Fishing activity occurs on the lake as well as on the lake's outlet Marl Creek. Some anglers use canoes or small boats equipped with motors. Some of these boats are cached on shore during the fishing season. Anglers most frequently gain access to the lake from the north using Sideroad 24/25.

Documentation of use of the study area by the Brereton Naturalists Club indicates the area has attracted people interested in nature study/appreciation for many years.

While there is little evidence of use of the properties of the study area for trail based activities, Concession VI (Ryther Road) along the south boundary has been used for hiking/walking, snowmobiling and by those using other types of motorized vehicles, such as motorcycles, and all terrain vehicles.

Trapping of fur bearing mammals has been occurring in and adjacent to the study area. Species taken in the past include muskrat, mink, beaver, raccoon, fox, coyote and weasel. This resource management activity has been carried out by a licensed trapper.

4 Biophysical Resources

4.1 Climate

Climate, together with soils and topography create the environment within which plants and animals exist in a natural ecosystem and thereby determine the specific mix of species which will inhabit any particular location.

In Southern Ontario, climatic conditions are strongly influenced by the presence of the Great Lakes and by variations in topography. Data presented in Table One illustrate the influence of these two factors on the climate of the study area.

Overall, the climate of Southern Ontario is described as "continental" with warm summers, cold winters and with precipitation occurring throughout the year. However, mean temperatures and precipitation vary with distance from the large bodies of water and with elevation. Year long mean daily minimum and winter season average temperatures decrease as distance from Georgian Bay increases and generally, average total precipitation levels increase with increasing elevation.

Table 1: Selected Climatic Data From Four Southern Ontario Stations

	C'wood	Redickville/	Midhurst /	Angus
Mean Daily Temperature (°C)	6.0	4.9	6.1	6.1
Mean Daily Maximum Temp. (°C)	11.4	9.8	11.6	12.1
Mean Daily Minimum Temp. (°C)	2.4	0.1	0.5	0.1
Mean Daily July Temp. (°C)	19.6	18.1	19.5	19.5
Mean Daily Jan. Temp. (°C)	-6.6	-9.3	-8.8	-8.4
Frost Free Days	149	123	118	121
Mean Total Precipitation (cm)	78.56	89.86	90.29	82.88
Mean Snowfall (cm)	246.12	238.76	237.99	240.53
Elevation (m)	182.8	522.7	225.5	191.1

Sources:
1. Canadian Climate Normals Volume 6, Frost 1951-1980
2. Canadian Climate Normals Volume 2, Temperature 1951-1980
3. Temperature and Precipitation 1941-1970 Ontario

The data for Collingwood (C'wood) in Table One can be considered as an accurate representation of the average temperature and precipitation values to be experienced in the study area. The frost free period or growing season is a good indicator of the moderating influence of Georgian Bay. It is substantially longer near the shore and permits the existence of plants requiring longer growing seasons. It also makes areas such as the study area more attractive to migrating waterfowl and other types of wildlife especially in the fall when the onset of the first frost is delayed by as much as three weeks.

While total annual precipitation is less in the study area than further inland average snowfalls are higher and so represent a higher percentage of the total precipitation. This factor may have an impact upon some wildlife particularly during winters with above average snowfall.

4.2 Geological Resources

4.2.1 Bedrock Geology

The bedrock underlying the study area has very little effect upon the surface features/topography of either the study area or surrounding areas. They are limestones formed during the Middle Ordovician geologic period from marine sediments of marl, clay, sand and marine organisms. Over a long period of time the accumulated sediments became cemented under pressure from overlying material to form rocks which are now 500,000,000 years old.

In the study area they are deeply buried under at least 50 m of materials deposited by glaciers and the action of lake water.

4.2.2 Surficial Geology

Formation of the landform features of the study area and the surrounding areas occurred in stages over the past 12,000+ years.

Marl Lake is situated near the northeast end of a sand plain, part of a former lagoon. Between the sand plain and the present day shoreline of Georgian Bay are a series of features created by wind and water acting upon massive amounts of sand, silt and clay. To the north of Marl Lake are large, high parabolic or horse-shoe shaped sand dunes, followed by lower, irregular, parallel transverse dunes, still lower raised beaches and, finally, the present day active beach.

Landform evolution began with the decay or retreat of the last continental ice sheet, the Wisconsin. Large amounts of melt water collected along the ice front in the depression caused by the massive weight of the ice. The resulting Lake Algonquin lasted for about 1000 years and covered in part a large portion of present day Simcoe County. Land rebound and improved drainage through the Mississippi River valley lowered this lake. However, 2000 years later, increased melting and loss of the southerly drainage route due to rebound, caused water levels to rise resulting in formation of glacial Lake Nipissing.

Over the thousands of years that the post glacial lakes existed, large amounts of sand accumulated in what is now southern Georgian Bay. A barrier bar began to form from this material 7000 years Before Present. With time, the action of prevailing north westerly winds and diminishing water levels caused the bar to grow and sand dunes to develop until a large lagoon was sealed off behind it. The parallel dunes and higher parabolic dunes developed and, as rebound continued, a series of raised beaches evolved.

During this time the Nottawasaga River evolved in the former Lake Algonquin bed and the lagoon and cut a channel through the dunes. A large part of the former lagoon is within the Nottawasaga River's flood plain and the associated fluvial deposits have been laid on top of the older post glacial lacustrine deposits. Marl Lake and Jack's Lake are the last vestiges of the lagoon system.

4.2.3 Topography

The topography or relief of the study area and the area surrounding it is dominated by the high parabolic sand dune complex to the north and west of the study area. Some of these dunes rise more than 50 m above the level of Georgian Bay. The contact between these dunes and the sand plain is very distinct and has been emphasized by an abrupt change in landuse from forestry and scattered residential to agriculture and golf course. The study area occupies a shallow depression in the sand plain. At its deepest this depression is 3.5 m deep. The sand plain slopes very gently to the south west through the study area.

4.2.4 Soils

Development of soils in and around the study area has taken place on parent materials dominated mainly by clays and silts with localized sand deposits. Throughout the former lagoon, marls and marly silts were deposited. Marl is a type of heavy, grey clay deposited in quiet, relatively shallow lacustrine environments. These clays are generally poorly drained and require the installation of drainage works to improve their agricultural crop production potential. They also tend to be alkaline or calcareous and this factor strongly influences the species of plants which can thrive on them. They form the bed of the lake and wetland in the study area and underlie soils in the surrounding areas including the fields in the south west.

Deposits of organic matter have accumulated within much of the wetland particularly in the swamp areas fringing the south, east and north portions of the lake as well as within the heavy cattail marsh.

4.2.5 Hydrological Resources and Water Quality

4.2.5.1 Surface Water

The Marl Lake wetland occupies part of a 16.5 km^2 drainage basin which forms the headwaters of a tributary of the Nottawasaga River. Two water courses which intermittently feed surface waters into the wetland from the north and east, have been subject to drainage improvement works implemented under the Ontario Drainage Act. The water course from the north has two tributaries one of which begins 2.5 km north of the wetland while the other commences six km to the east. Portions of the north tributary and the main branch (Flos Drain) were subjected to a clean out operation in the late 1970's. The second inflow starts approximately 1.75 km to the east. Major drainage improvements were completed in 1987 (20th Sideroad Drain). As a result an open, shallow ditch currently crosses fields to the east of the study area, cuts through the swamp on the east edge of the wetland and ends in the marsh.

Outflow is via Marl Creek which flows south and west. It was subject to a clean out as part of the work on the Flos Drain.

It has been observed that while surface inflows are intermittent, outflow is constant but variable. (NOTE: Accurate flow data are not currently available)

In addition to the above drainage improvements, systematic tile drainage has also been installed in some adjacent fields. As a result water is removed from these areas more quickly and peak downstream flows are quite likely larger than they were previous to implementation of drainage improvement projects.

An undesirable result of the increased water flows combined with inadequate design engineering has developed on the 20th Sideroad Drain. Despite the fact that this drain is less than three years old, a large quantity of sand, silt and clay, eroded from upstream fields and stream banks, has collected in the ditch and has also formed a delta at the end of the drain, in the marsh. Very little flow capacity remains and when it is exceeded, water will be forced onto fields adjacent to the study area as well as into the swamp forest. A clean out of the ditch will then be required if the drain is to remain effective. Prevention of re-occurrence of this problem will require special measures such as installation and maintenance of an up-stream silt trap and possibly, installation of erosion protection on stream banks.

The average water level in Marl Lake is 183 m above sea level which is 6.7 m above the mean chart datum level of Georgian Bay. The very flat topography of the Lake Nipissing lagoon bottom results in low rates of fall in the streams draining it. Between Marl Lake and the Nottawasaga River the fall in Marl Creek is approximately 1 metre.

4.2.5.2 Ground Water

Evapotranspiration rates for the area are such that, when combined with outflow, total water losses exceed gains from surface inflow and precipitation. Given that fluctuations in the lake's water level are not extreme, it appears that inflows must include discharges of ground water. While the locations of all discharges have not been determined, it is known that a number of seepages occur along the north shore as well as in the south west portion of the lake. Ponds, developed on the adjacent golf course and which drain into the lake, utilize ground water springs and seepages. There is also some evidence to indicate that water is discharged through the bed of the lake. Analysis of aerial photography and observations made on the lake provide an indication that a narrow band roughly parallel to the north shore and centred less than 200 m from shore may be a ground water discharge zone.

Very little submergent or emergent vegetation occurs in this area and the lake bottom has a very clean appearance. Data collection and analysis using temperature and water pressure measuring equipment could help to identify the location of bottom inflows more precisely.

4.2.5.3 Water Quality

Currently little data are available with which to assess water quality. Any analysis should relate to the use(s) to be made of the particular body of water under study. In the case of a wetland where waterfowl production values are under consideration, the ability of the water resource to produce biomass, i.e. provide food stocks for plants, aquatic invertebrates, fish and wildlife is an essential criteria to assess. Water containing more nutrients/dissolved solids can produce more biomass than can water with fewer nutrients.

Research has revealed a relationship between where a wetland is located (site) and its productivity. Marl Lake, situated on the headwaters of a small stream system, is considered a Palustrine site. Since it relies upon limited overland flow, rainfall and groundwater for its water and nutrient supply, productivity is low. Data collected during the 1984 inventory/evaluation of the wetland confirm that nutrient levels are relatively low as indicated by total dissolved solids.

Other indicators of water quality such as dissolved oxygen, transparency and turbidity, pH, total alkalinity, specific nutrient levels and bacterial content have not been measured. A need for these data has yet to be identified.

4.3 Biological Resources

4.3.1 Vegetation Communities and Flora

The vegetation communities and flora of the Marl Lake wetland have been studied during four inventory programs; 1975 (Bobbette), 1981 (Hanna), 1984 (Hanna) and 1989 (Brunton). In each study it was concluded that the area's flora is very significant due to the presence of at least one unusual vegetation community and several rare or unusual plant species.

The Brunton Study served to review and update the area's botanical inventory and is the principle source of information for this summary.

Ten vegetation communities comprising upland and two wetland vegetation types were identified, and six were mapped.[10]

Three of the communities are situated on dry or very dry upland sites, mostly to the south of the lake in the areas previously used for agriculture. Two small areas of upland intolerant deciduous forest are the exception to this. One is located north of the lake, the other along the south west edge of the wetland. All three communities are considered to be of very little or limited floristic significance.

Four of the vegetation communities represent the swamp wetland vegetation type. Two of these contain floral species considered to be of limited significance. The first consists of small scattered pockets of lowland intolerant coniferous swamp forest dominated by somewhat open stands of larch and cedar with dense undergrowth occurring on saturated organic soils. The second, also occurring on saturated organic and sand soils is described as thicket swamp. It is characterized by a dense tangle of various shrubs and tall herbaceous species.

Of slightly more interest are larger areas of a lowland intolerant mixed swamp forest dominated by cedar and white birch. This community occurs on wet organic soils at the north end of the lake and in a narrow band between the upland forest and the open wetlands along the western shore (not all within the publicly owned lands). A number of interesting plant species are found in this forest type.

Lowland intolerant deciduous swamp forest occurring along the northern edge of the lake and adjacent to marsh communities in the northeast and east is the most significant swamp community due in part to the presence of pale sedge (Carex pallescens) a regionally significant species. The community is found on very wet organic soils and is dominated by black ash and speckled alder.

The three marsh wetland type communities are the largest of the vegetation communities in the study area. Of these the largest consists of three areas of shallow marsh heavily dominated by cattails (Typha sp.). It grows over marl and silt sands in saturated to shallow moisture conditions. Scattered clumps of wetland shrubbery and forest are found and tall bulrush (Scirpus sp.) and other emergent aquatic species are mixed with the cattails.

This type of marsh is commonly found on similar sites in southern Ontario and at Marl Lake contains no regionally significant species.

The second marsh community is a mixed (emergent and floating) marsh occurring in shallow, quiet water over sand or marl and in calcareous (slightly alkaline) water. Vegetation is dispersed in this community and is dominated by pondweeds (Potamogeton illinoensis and Najas flexilis) and great bulrush (S. validus). It contains no regionally significant species.

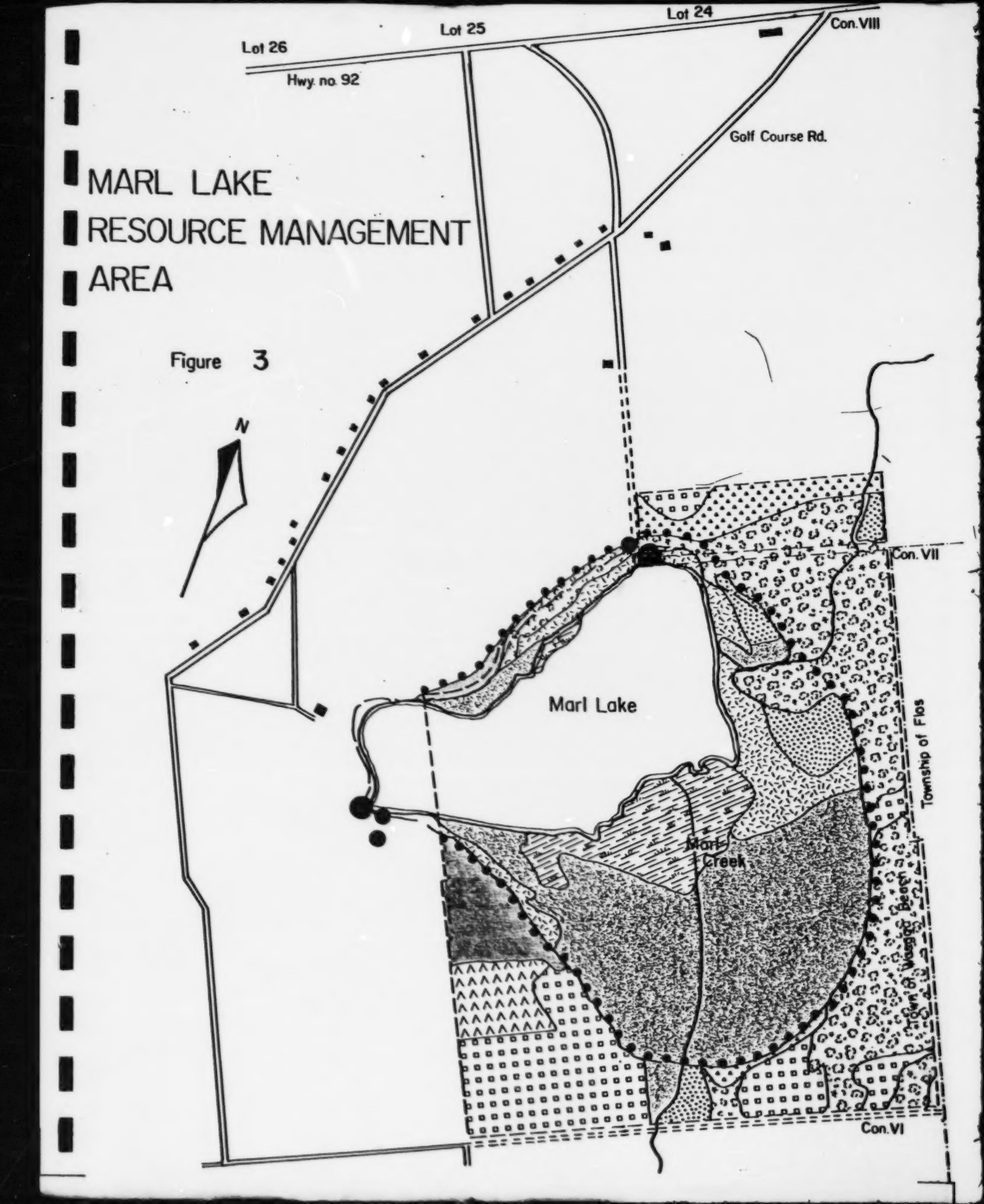
The smallest of the marsh communities is also the most significant in the study area. Wet meadows are found adjacent to large portions of the shoreline. The Brunton study (p. 43) describes them as fen like marl meadows and they are characterized by wet to saturated moisture conditions and organic/marl soils. The community is a diverse mixture of grass and sedge flats on the very gently sloping shores of the lake and is drier than a true marsh type community.

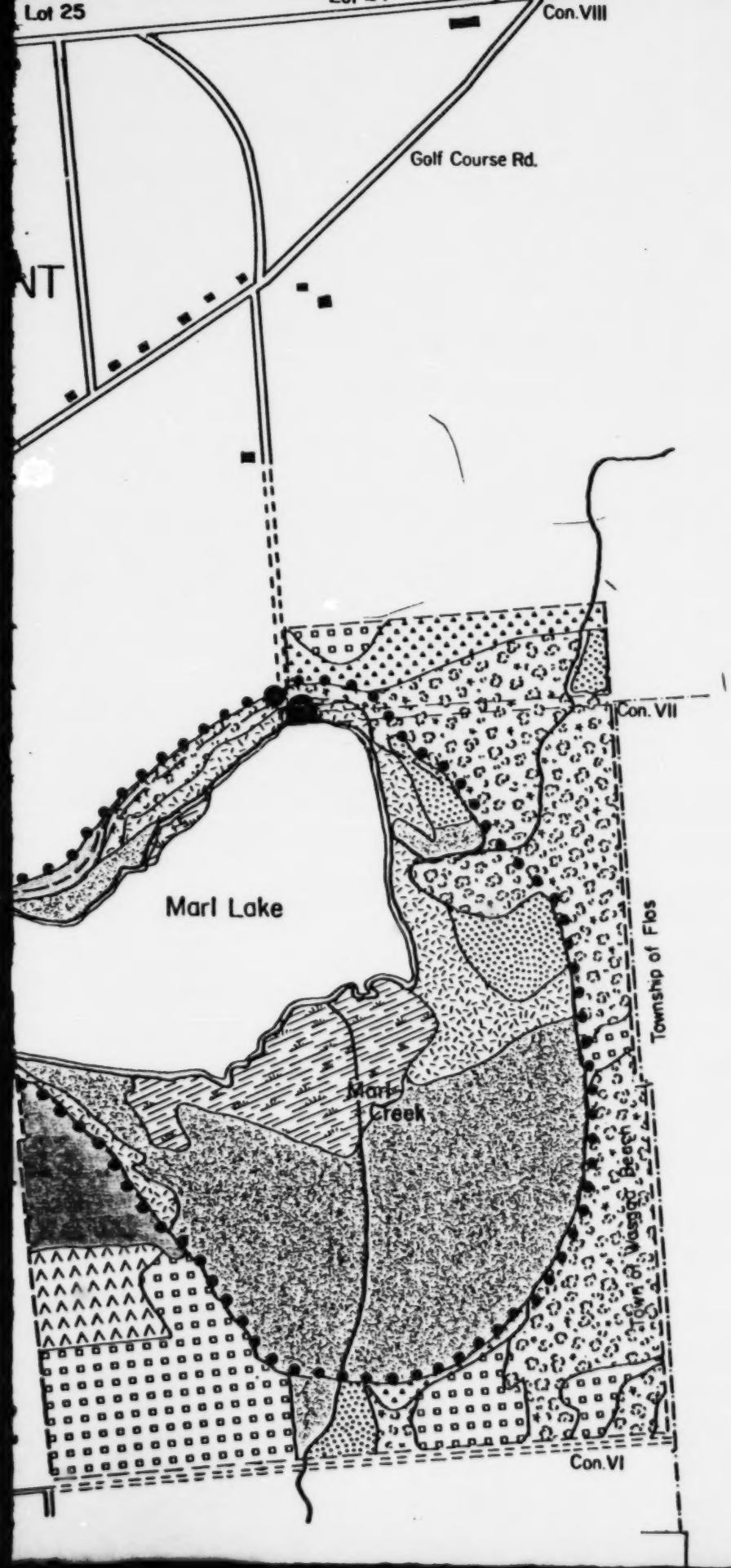
At Marl Lake this community contains one nationally and two regionally significant species. Only one of these, the nationally rare beaked spike rush (Eleocharis rostellata) is known to grow within the acquired property near the road allowance at the north side of the lake. Leaden sedge (Carex livida) and slashed avens (Geum laciniatum), regionally significant species were identified on the golf course property at the west end of the lake.

This community is considered to be the most significant in the Marl Lake (study area) as it is considered to be a relict plant community which originally evolved on the shorelines of post glacial Lake Nipissing and which is found more commonly along the present day shoreline of Lake Huron and Georgian Bay.

4.3.2 Fauna

To date the fauna of the Marl Lake study area has not been subject to a systematic, comprehensive inventory study. What is known of these resources has been gathered from fur management records maintained at the Huronia District Office, from observations recorded in other inventory studies and from informal observations provided by ministry staff and private individuals.


MARL LAKE
RESOURCE MANAGEMENT
AREA
Figure 3
N
Lot 26
Lot 25
Lot 24
Con. VIII
Hwy. no. 92
Golf Course Rd.
Con. VII
Marl Lake
Marl Creek
Township of Flos
Con. VI



VEGETATION COMMUNITIES

LEGEND

Open, improved road

Open, unimproved road

Lake boundary

Marsh boundary

M.N.R. land boundary

Building

Creek

Municipal boundary

ANSI boundary

Scale 1:10000

100 0 500 meters

Upland meadows and dry thickets

Intolerant deciduous swamp forest

Intolerant mixed swamp forest

Intolerant coniferous swamp forest

Thicket swamp

Wet meadows

Mixed marsh

Shallow marsh

Nationally significant plant species

Regionally significant plant species

4.3.2.1 Mammals

The study area's habitat is used by a wide range of mammals all of which are common in south central Ontario. These include but are not limited to beaver, muskrat, mink, raccoon, red fox, coyote, short tailed weasel (ermine), woodchuck, red squirrel, grey squirrel, eastern chipmunk, cotton-tail rabbit, snowshoe hare, striped skunk, deer mouse and white-tailed deer. This last species may be using the forested areas in and adjacent to the study areas as a seasonal staging area prior to moving into nearby wintering areas. Well used wildlife trails exist along the south and east sides of the marsh and provide evidence of the movement of deer, and other wildlife, between the extensive forested sand dune area to the north and west and the lowland forests along the Marl Creek and Nottawasaga River.

The area is considered to be locally important for wildlife due to the presence of a diversity of habitat which in turn supports a diverse mammal population.

4.3.2.2 Birds

The study area's bird population is also very diverse. Approximately 230 species of birds have been recorded from the Wasaga Beach area. Of these, four species known to have utilized Marl Lake are considered to be provincially significant. These are least bittern, black tern, yellow rail and short-billed marsh wren (sedge wren). Least bittern, black tern and possibly short-billed marsh wren are known from historical record to have been breeding in the area since the 1920's. Yellow rail was recorded only as a possible species (heard only) in the 1988 Biological Inventory (Brunton) and no definite records of it exist for the study area.

All but yellow rail are now of Provincial significance due to declining populations brought about by the loss of wetland habitat.[11] The three species are dependent upon wetland habitat and Marl Lake is within the core Ontario range for these species. During the 1988 study no evidence was seen to indicate that any of the species were currently nesting in the area. This apparent absence of nesting activity may be explained by a reduced water level in the wetland however, more data on nesting activity is required to determine the populations using the area.

While yellow rail may be present in the study area, this species is south of its' summer range in the coastal fens along James and Hudson's Bay. It is seen very rarely in Southern Ontario and is unlikely to be nesting in the Marl Lake wetland given the very limited amount of suitable habitat available.

Two other bird species have been documented in the Marl Lake area and are discussed in the Brunton report. They are described as being very local and/or rare in Simcoe County and/or in southern Ontario as breeding species. They are grasshopper sparrow and yellow-billed cuckoo. The first is a nesting species in the area and is noteworthy because it is a recent (20th century) arrival in Southern Ontario and is increasing in numbers. The other species is much less common. Yellow-billed cuckoo was observed in 1988 and is believed to be nesting in the area. This species core range is the Carolinian forests of Southern Ontario and the United States and so, in the area, is at the northern edge of its range.

The checklist of birds for Wasaga Beach (Brunton, 1988) includes a large number of waterfowl species. Most of these are seen in the study area as staging migrants or as feeding in Marl Lake while nesting in larger wetlands situated nearby; e.g. Tiny Marsh. Only those species most abundant in southern Ontario are likely to be nesting in the Marl Lake wetland. They include; ducks - mallard, wood duck, black, blue-winged teal, and - Canada goose. The wetland inventory/evaluation of 1984 considered the area to be locally significant for both waterfowl production and staging.

4.3.2.3 Reptiles and Amphibians/Herptiles

There is no documented evidence to indicate that the study area contains populations of significant, i.e. rare or unusual, herptile species. Eight species were observed by Brunton within the entire Wasaga Beach Provincial Park area. An indication of which species are/were present in the Marl Lake Wetland was not provided. Two additional species were observed in 1989.

The species observed are as follows:

american toad
spring peeper
tetraploid grey tree frog
wood frog
leopard frog
green frog
snapping turtle (1989)
painted turtle
common garter snake
red-backed salamander (1989)
mudpuppy

Three other species of reptiles are known to occur on dry or dry and sandy sites, similar to those present in Wasaga Beach, along or near the Georgian Bay shoreline. Due to the small size of known populations the three are considered Provincially Significant. A lack of recent documented sightings in the Wasaga Beach area should not be interpreted to mean the species are not present.

The three are: eastern hognose snake
northern ring-necked snake
fox snake

4.3.3 Fish

Marl Lake contains populations of a number of species of fish all of which are classified as warm water species. An indication of the current status, i.e. size and health, of these populations is provided in the summary report of a lake survey carried out in July of 1989.

The following species were documented as inhabiting the lake:

northern pike
largemouth bass
pumpkinseed
bowfin
carp

A survey conducted in 1972 did not document the presence of carp. In the intervening time a relatively large population of this species has become established.

As mentioned in section 3.4, the lake is used for sport fishing. No site specific data are available to indicate which species is preferred however, largemouth bass is probably the most popular. This species is probably detrimentally impacted by carp which alter habitat and would benefit from some form of management program designed to reduce the carp population.

5.0 Cultural Resources

5.1 Prehistoric Resources

Information on the occupation of the study area by native peoples has been documented in the report of a 1974 Archaeological Survey of Wasaga Beach (O'Brien), on an Archaeological Survey of Canada - Site Record Form, and in the published writings of Andrew F. Hunter, Simcoe County historian in the early 1900's. The prehistoric cultural resources of the Wasaga Beach area are important as indicated by the fact that 28 archaeological sites have been identified.

Two sites are known within one half km of the Marl Lake Resource Management Area. The Marl Lake Site (Borden Designation - Bd Gx-4), was discovered in 1906 by Hunter and is located on the Marlwood Golf Course in the north half of Lot 26, Concession VII. Since the original discovery, development of the golf course club house resulted in destruction of the site. The area was re-examined in 1973 and 1974. Based on the limited archaeological evidence found, it has been concluded that the site was probably used as a seasonal campsite during the Late Woodland period (800 A.D. - 1650 A.D.). Those using this site were either of the Huron or Petun tribes of the Iroquoian group of aboriginal peoples. The Hurons occupied areas to the east and north east while the Petuns were concentrated along the Niagara Escarpment to the west. Both tribes were agriculturalists. Based upon the recovery of European trade goods it is assumed the site was in use at the time of European contact in the early 1600's.

The second site is located in the north east quarter of Lot 26, Concession VI (Borden designation Bd Gx-5). It has been disturbed through development of a farming operation. Very little is known about this site however, it is considered to be a small campsite of the late Archaic period (6000 B.C. to 500 A.D.). These peoples were nomadic hunters and gatherers who would have camped here to take advantage of local resources. The 1974 archaeological survey report acknowledged a

need for more survey work in areas considered to have significant potential. One of these areas includes the study area. This recommendation has not been acted upon.

5.2 Historical Resources

While Europeans began using the area in the late 1700's when the Nottawasaga River formed part of a fur trade route from York (Toronto) to the upper Great Lakes, actual settlement did not occur for nearly a century. Early development of the Penetanguishene Road (Hwy 93) for miliary purposes lead to the east portion of Flos Township being settled in the 1820's. The flat, featureless plain which dominates the Township attracted little settlement activity until the 1870's when the small communities of Crossland, Langman and Allenwood were established to the east and northeast of Marl Lake.

Additional research is required to determine more precisely when settlement occurred in the immediate vicinity of Marl Lake. In 1881 a major forest fire destroyed a large area of the western part of the Township and forced some residents to rebuild.

5.3 Built Features

The evidence of past human activity in the study area is limited to the cleared areas in the southwest. Some of this area has been allowed to revert to forest cover. Remnant rail and wire fences together with vegetation patterns indicate the field boundaries. One fence has been constructed across the marsh and may provide evidence of use of the south part of the present day marsh for livestock pasture. There is no evidence of a dwelling or other farm buildings on the study area.

6.0 Resource Significance and Sensitivity

6.1 Wetlands Evaluation Program

Previous sections contain information relating to the significance of certain resource features found in the study area. This information was generated as a result of the study area being surveyed as part of the Provincial wetland evaluation program and the Provincial Areas of Natural and Scientific Interest (ANSI) program. The findings and recommendations contained in the evaluation/inventory reports prepared under these programs are important to the development and implementation of a management plan for the Marl Lake Resource Management Area.

An Evaluation System For Wetlands of Ontario south of the Precambrian Shield (1984) is a broad based approach to assessing wetlands, incorporating social as well as biological, hydrological and special features components. The system uses an objective means of evaluating elements within each component and requires that points be assigned to each element. The evaluation of the Marl Lake wetland, completed in 1984 and revised in 1986, contains high values for three of the four components with special features receiving the highest value. While this value did include points for the presence of provincially significant animal species it was not based upon recognition of the presence of provincially significant plant species.

The other three components listed in descending order of significance were biological, social and hydrological. The end result of the evaluation was the classification of the wetland as "Provincially Significant", Class One.

In addition to the evaluation program, wetland management in Ontario involves a number of protection programs which provide for acquisition especially where a potential change in landuse (conversion) threatens a provincially significant wetland (class one or two). Implementation of this acquisition policy lead to purchase of the Marl Lake wetland. Beyond outright acquisition, protection of wetlands is to be achieved through the efforts of private landowners (stewardship) and through the municipal landuse planning process. The latter involves numerous agencies including the Ministry of Natural Resources which provides technical information on wetlands to municipalities and implements a plan input and review program. Through this program the Ministry tries to ensure that wetlands

are not converted for other land uses and that uses on properties adjacent to wetlands are not in conflict with the goals of wetland conservation and management.

6.2 ANSI Program

Through the ANSI program areas of land and water which contain special features or landscapes are recognized, the features are assessed and appropriate management strategies are developed and implemented. Areas containing special features are placed in either or both of two categories; biological or life science and geophysical or earth science areas of natural and scientific interest. The significance of special features and therefore the level of need for protection of features is determined through reference to frameworks which organize the province's life and earth science resources; into site regions and districts for life science features and geological and geomorphological themes for earth science features.

The report A Biological Inventory and Evaluation of Wasaga Beach Provincial Park and Adjacent Natural Areas contains a recommendation that portions of the study area be designated a Provincially Significant Life Science ANSI. This recommendation is based upon the presence of three special biological features: 1. A wet fen-like marl meadow vegetation community presently not well represented on publicly managed lands within site district 6.6; 2. One nationally rare and two regionally rare plant species and; 3. Four Provincially rare bird species.

Overall, there is a good diversity of plant habitats within the study area and the diversity of floral species documented is equally impressive. Numerous species are at or near the limit of their ranges the cores of which are located either north or south of this area. With few exceptions plant species are lime/alkaline tolerant.

The wet, fen-like marl meadows are unusual in this location because the community is considered a relict from post glacial Lake Nipissing shore vegetation and is now known to occur in only one other inland location in South-central Ontario (a small community in Awenda Provincial Park). At Marl Lake this very diverse community appears to be evolving toward a wet thicket type of vegetation with greater numbers of shrub species crowding out the water tolerant sedges. This is probably due to a relatively gradual lowering of the lake's average annual water level.

The nationally rare beaked spike rush growing in this community is more commonly found across the Southern United States and along the Atlantic Coastal Plain and so is at the northern limit of its range here.

Seven other noteworthy species are growing in the wet marl meadows. Two are considered important within a regional perspective while the remainder are locally significant.

These species are as follows:

Regionally Significant	Locally Significant
+ leaden sedge (Carex livida)	0 Lindheimer's panic-grass (Dichanthelium acuminatum)
*+ slashed avens (Geum laciniatum)	* mermaid weed (Proserpenaca palustris)
	** least bladderwort (Utricularia minor)
	** Labrador bedstraw (Galium bradoricum)
	0 Ohio goldenrod (Solidago ohioensis)

* Southern species - at or near the north edge of range in south central Ontario

** Northern species - at or near the south edge of range in south central Ontario

\+ Common in Southern Ontario

0 Range of species is restricted to south central Ontario especially near shoreline of the Great Lakes

6.3 Water Levels - Trend and Impacts

It is difficult to predict the impact changes in the water level regime would have upon the wetland's vegetation communities. Based upon impacts of drainage works observed in other wetlands however, it can be assumed that the past improvements to the Flos and 20th Sideroad drains have caused lowering of water levels. This, in turn will have an impact upon vegetation communities. In the historic more natural situation, a gradual inflow combined with a smaller (volume) outlet probably resulted in a prolonged spring high water level relative to the current situation. It is probable that the greatest impact on the natural regime followed completion of the cleanout work on the downstream portion of the Flos Drain (Marl Creek) in the late 1970's. Observations documented in the Biological Inventory and Evaluation indicate that water levels are lower than in the past and that near shore aquatic vegetation communities are being invaded by plant species which favour drier conditions. In the absence of other documented data, the botanical evidence of declining water levels and other visual indicators must serve as the best indicators of a trend.

There are a number of factors which influence or determine the specifications of any natural water level regime. Some, such as climate, are uncontrollable, others, such as beaver activity, may be managed. Presently Marl Lake cannot be considered to have a natural regime however, over time conditions could revert to a pre-drainage improvement state. The desirability of returning as nearly as possible to a natural situation must be determined by the management goal and objectives adopted in the area's management plan. In turn, these must recognize the Goal and Objectives of the Co-operative Program For Management of Waterfowl Habitat in Ontario (see Section 1. p. 2) for which the property was acquired. Co-operative management strategy number two, of the program, states that, "management of wetlands for waterfowl will be compatible with the welfare of other plant and animal species. Waterfowl management will be a secondary consideration in wetlands where other species have higher management priority. The welfare of rare, threatened and endangered species will be of prime concern in wetlands where they exist." (p. 2).

Clearly, habitat in the study area supports a number of significant plant and animal species. Experience and knowledge acquired in managing other wetlands for waterfowl breeding and staging indicates that species of birds and animals which favour marsh habitats benefit from water level management programs.

Over time, aquatic vegetation in a wetland can evolve to a point where a relatively small number of plant species dominate and 'lock up' a large percentage of the available nutrients. Generally, the fewer the number of plant species and/or combinations of species, the less will be the diversity of birds and animals present. The vegetation aging process can be effectively reversed by changing water levels. Raising levels initially results in loss of plants. However, decomposing plant matter releases nutrients which become available for other forms of life including invertebrates, an important food source for waterfowl. Younger, more diverse plant communities result as water levels are lowered, then raised again in a cycle. Bird species such as black tern, least bittern and sedge wren will benefit and waterfowl may be attracted to such improved habitat. Mammals will also benefit from improved food supplies.

While the impact of water level management at Marl Lake, on birds and mammals, may be largely positive, the potential impact on some of the significant flora is uncertain. Currently, the most diverse/significant plant communities are situated around the perimeter of the marsh and occupy a transition zone between marsh and upland habitat. The impact of periodically higher water levels upon the wet meadow community containing the nationally rare beaked spike rush would be dependent upon the specifications of the program adopted. A critical specification is the maximum water level during the fully flooded part of the cycle combined with the length of time this level is maintained during each cycle. If this upper level is too high and is held for too long, the community could be drastically altered.

In some areas, the community might be able to shift to and maintain itself at a higher elevation. However, the likelihood of this occurring would be dependent upon many factors including existing upslope vegetation, moisture and soil conditions. A considerable length of time might also be required during which water levels are increased gradually so that an evolutionary process could occur.

From preliminary investigations, including elevation surveying, it appears that a water management program could be implemented which would result in a net benefit to waterfowl and other bird populations without causing significant impact to the wet meadow communities. It is also apparent however that the fully flooded elevation of a management cycle cannot be either as high as it could be if protecting the plant community were not a consideration.

7.0 Resource Production/Utilization Targets

This section deals with the measurable resource values of the Marl Lake Resource Management Area. These values are expressed as numbers of opportunities available for the public to pursue various recreational activities or as units of a resource which can be produced on a sustained yield basis. These values are derived from analysis of resource inventory data, known production capabilities of other, similar wetlands and data describing historic production of resource products from the area.

The targets have been prepared within a multiple use/integrated resource management context. In some instances a greater value could be targeted for a specific resource or recreation activity however, this could result in an unacceptable reduction in the target value of another resource product or in the utilization of other recreation opportunities.

Documentation of the process of developing the values is provided along with discussion of the relevant factors such as the increase in value which can be expected as a result of implementing management programs.

7.1 Waterfowl Production

Waterfowl production is considered to be the resource which will benefit most from the implementation of management programs such as water level manipulation, opening up of portions of the dense cattail vegetation, construction of nesting mounds, improving upland nesting habitat, providing of food crops. Waterfowl utilize wetlands for either breeding sites and or staging areas for spring and fall migrations. The proximity of the much larger, more diverse and intensively managed Tiny Marsh has an undetermined impact upon waterfowl's use of Marl Lake. In addition the size and make-up of the current breeding bird population has not been fully determined.

Table 2:

Waterfowl Targets (Birds/Year)

Low		Medium[3]	High[4]
Scenario 1[1]	Scenario 2[2]		
36	18	61	159

1) Assumes that first beaver dam on outlet, below bridge, is removed either through natural processes or by man. Water level would go from a spring flood elevation of 183.5 to 182.9 by June 1 (2' fluctuation). No goose production.

2) Assumes drainage works implemented on outlet which would lower June 1 elevation to 182.2 (base of outlet channel) reducing productive area to less than 40 ha. including open water and a fringe area. No goose production - 3 broods of ducks.

3) Assumes first beaver dam remains. Water level would fluctuate between 183.5 and 183.2 (8"). This level approximates existing production which includes ducks only.

4) Assumes a fully managed hydrologic regime with water levels similar to historic/pre drainage works, levels. Normal operating level (N.O.L.) would be 183.5. Production level is similar to levels demonstrated at Tiny Marsh. 83% of production would be ducks, 17% goose production.

It is, therefore, difficult to develop a production target. Ducks Unlimited has a great deal of experience in managing wetlands and has developed expertise in predicting the productivity of wetlands. The targets in Table 2 were developed with assistance from Ducks Unlimited Canada staff and reflect a range of waterfowl production potentials given no management (low figure) and with an intensive management program.

7.2 Fur Management

The primary source of population data for furbearing mammals is the fur harvest as reported by a licensed trapper who has been trapping in the area for several years. Table 3 contains fur harvest data for Marl Lake and vicinity for 1988-89.

It is important to note that fur harvest may vary because it is affected by the level of effort put forth by the trapper and this may be influenced by factors such as weather conditions, other employment opportunities of the trapper and the market value of the pelts of various species. Another consideration in the use of harvest data in the case of Marl Lake is determining the precise origin of the furs given that Marl Lake represents only a portion of the trapper's territory. While acknowledging the limitations of the harvest data, it does provide an accurate indication of the species present and some indication of the size and health of furbearer populations.

Based upon knowledge gained in other wetlands it is reasonable to expect an increase in populations of some furbearers, e.g. muskrat, beaver, mink; following implementation of wetland management programs especially those involving water level manipulation.

The targets for fur production in the Marl Lake Resource Management Area are presented in Table 3:

Table 3: Fur Production Targets

Species	Low Target - Without (1) Water Level Management Pelts/Yr	High Target - With Water Level Mgmt.
Muskrat (2)	125	500
Mink	4	12
Beaver (3)	4	10
Other (4)	0	0

(1) These targets are equal to current production (1988-89).
(2) Currently there are approximately 25 houses in the marsh. Raising and lowering water levels would greatly stimulate production.
(3) Currently there is one active colony in the marsh.
(4) Species include fox, coyote and raccoon.

7.3 Hunting Opportunities

As discussed in section 3.4 there is currently no hunting season involving the use of shotguns or rifles at Marl Lake. Archery hunting has been and is permitted. The targets below have been calculated based upon the two relevant by-laws of the Town of Wasaga Beach being amended to permit the use of shotguns only for waterfowl hunting. The archery hunting target is kept separate and includes hunting for upland game and white tailed deer.

The waterfowl hunting target is expressed as two figures representing a range of opportunities which may be made available. Both figures are based upon a highly controlled situation featuring a small number (less than 10) of numbered parking spaces and hunting stations. The higher figure represents the opportunities provided with six parking spaces available for a 45 day season. Such a season would open on September 25 and close by November 15. Beyond mid-November the lake is likely to be frozen over.

The lower target reflects a restricted number of parking spaces/hunting stations.

The range of archery hunting targets was arrived at in a similar fashion.

The two formulas and targets which follow are suggested options. Others may be considered (e.g. restrict season to mornings only or Saturdays only).

The targets for hunting in the Marl Lake Resource Management Area are presented in Table 4:

Table 4: Hunting Targets

a) Waterfowl Hunting

High Target	Formula Element		Low Target
45	Season Length in days	(S.L.)	45
6	Access Spaces	(A.S.)	3
2	Hunters/Access Space	(H.A.S.)	2
2	Turnover	(T.O.)	2
0.4	Constraint Factor	(C)	0.4
	Formula = A.S. x H.A.S. x T.O. x S.L. x C.		
432	= Opportunities/annum		216

(b) Archery Hunting	High Target	Low Target
Season Length	62 days	62 days
Access Spaces	6	3
Hunters/Access Space	1.5	1.5
Turnover	2	2
Constraint Factor	0.4	0.4
Target =	464 opportunities/annum	232

7.4 Fishing Opportunities

Currently fishing is the most popular recreation activity in the study area. Current data to evaluate the quality of fishing experience are not available. Fish populations in warm water lakes are more productive than those in coldwater lakes or in streams. This is confirmed in fisheries data collected in the Huronia District and used in the Huronia District Fisheries Management Plan 1989-2000. It predicts a fishing quality indicator, for warm water lakes in the district, of 0.5 kg/angler day. This figure may or may not be exceeded in the case of Marl Lake.

Using an, accepted formula, the total potential yield of the lakes fishery resource has been calculated to be 1635 kg/year. Due to two constraining factors however, this theoretical figure is considered to be unattainable. The shallowness of the lake is a major limiting factor which results in seasonal oxygen depletion and therefore loss of fish.

The second factor is the large carp population which out-competes other, more popular, angling species, especially largemouth bass, for habitat. Given these constraints, the realistic yield is considered to be 327 kg/year. Using the quality indicator (0.5 kg) this yield is converted to 654 angler days/year. This level of fishing activity would require the provision of six to eight parking spaces.

The implementation of a water management program could be expected to benefit fish populations especially during the flooded (high water) part of a management cycle by creating more habitat. This benefit could be offset by other factors such as oxygen depletion resulting from the decaying of vegetation. Implementation of an effective program to remove a large percentage of the lake's carp would be expected to benefit the more popular angling species however, the total potential yield would not likely change give that carp is a large fish and would be replaced by greater numbers of fish of smaller species.

7.5 Other Recreation Opportunities

Traditionally, the study area has been used for non-consumptive recreation activities including canoeing, wildlife viewing/nature appreciation and trail based activities such as walking/hiking, snowmobiling and ATV (All Terrain Vehicle) off-roading.

The most organized of these activities is snowmobiling. A portion of a maintained trail system follows Concession Road Six (Ryther Road) along the south edge of the property. Most ATV activity in or near the property is restricted to this road and connecting trails to the south and east.

The nature of these activities makes it difficult to define targets. More people participating in activities such as nature appreciation/wildlife viewing, walking/hiking and canoeing are likely to be attracted to the area should development of access facilities such as a parking area and trails occur. For these activities, targets are closely related to the size of the proposed parking area.

People involved in motorized trailing activity are not as likely to use the property as a starting point. Rather, they will pass through enroute to a destination. For this reason a target has not been calculated for these activities.

The combined target for other recreation opportunities including nature appreciation/wildlife viewing, walking/hiking and canoeing is presented in Table 5:

Table 5: Targets For Other Recreation Opportunities

	High Target (1)	Low Target (2)
Parking days available (P)	1900	1131 (3)
Users per parking day (U)	4	4
Constraint factor (C)	.4	.4
Formula P x U x C = opportunities/annum		
1906 x 4 x .4 =	3050	1810

(1) Based upon a 10 vehicle parking facility.

(2) Based upon a 6 vehicle parking facility.

(3) No parking days are available for these activities after the beginning of archery hunting season.

8.0 Optional Management Strategies

This section provides, in outline form, three management strategies. The strategy selected to form the basis of the Resource Management Plan will be based largely upon one of the three however, it may also contain elements from the others. The purpose of developing these alternative strategies is to attempt to ensure that consideration is given to all reasonable management options including that of doing little or nothing more than has been done in the past.

Strategies are conceptual in nature and have been designed with reference to two principles:

1. The principles of integrated resource management will apply so that whenever possible conflicts between resource management programs will be minimized and mutual benefits maximized.

2. Each strategy must provide for target achievement within the ranges presented in the Targets section of this report.

A "do nothing" management option while it must be recognized, has not been enlarged upon to form a separate strategy.

With two possible exceptions, implementation of this option would not permit achievement of even the low targets. The exceptions would be the lower archery hunting and fur management targets. In addition the option does not recognize/allow for, demands for use of the property which will be made as local and other populations increase. Failure to take an active role in directing/controlling that use could have undesirable consequences. For each strategy, major components are presented as is a brief discussion of the rationale behind the overall concept of each strategy.

8.1 Management Strategy "A"

This strategy is characterized by low intensity management programs and an emphasis upon citizen involvement to implement them. It is unlikely that all minimum targets can be achieved with this strategy especially as waterfowl hunting is not provided for and wetland management to improve waterfowl habitat would not occur.

- Access facilities are to consist of a parking lot for six to eight vehicles

- Management for waterfowl production is to be limited to improving upland nesting habitat in open field areas and erecting nesting structures in suitable swamp forest areas along the north and east sides of marsh. Local conservation clubs are to be encouraged to assist in these efforts through the CWIP (Community Wildlife Improvements Program).

- Fur management will involve one trapper continuing to utilize the area. A population monitoring program linked to quotas will be implemented so that populations can be properly utilized/protected.

- Hunting is to be limited to the use of archery only to hunt white tailed deer.

- Fishing is to continue as in the past. The ministry is to encourage sport fishing/angling for carp and is to attempt to interest an individual in netting carp on a commercial basis and thereby improve largemouth bass populations. To help ensure that a good quality largemouth bass population is maintained, anglers are to be encouraged to practice catch and release.

- In an effort to protect ANSI values the Ministry of Natural Resources is to promote the significance of the area's flora and fauna and to encourage local naturalist clubs to assist in monitoring populations, especially those of bird species to improve inventory information on nesting activity.

8.2 Management Strategy "B"

Relative to Strategy "A", this strategy is designed to provide for a greater level of resource production as well as for greater numbers of recreation opportunities.

- Access facilities are to consist of a parking lot for 10 vehicles located in the south corner of the property and an all season walking trail between it and a water access point probably located on Marl Creek at Concession Road Six (Ryther Road).

- Management for waterfowl production is to consist of improving the upland nesting habitat, erecting nesting structures as in Strategy "A" as well as implementing a number of marsh habitat improvement projects such as level ditching in the marsh designed to open up portions of the dense cattail mat and create new nesting areas.

- Fur management would occur as in Strategy "A".

- Hunting is to be expanded to permit archery hunting of deer and the use of shotguns for the hunting of waterfowl during a 45 day season and from three designated hunting stations within the marsh accessible by boat.

- Fishing and fisheries management is to occur as in "A" however, a more determined effort will be made to reduce the carp population. This effort might involve, for example, use of private sector contracts for netting and removal of carp.

- Protection of ANSI values is to include the conducting of additional hydrological and biological studies to determine the impacts of the Flos and 20th Sideroad drain improvement projects. Specifically they will attempt to determine what the impact has been upon the lake's average annual water level, the vegetation communities and flora and the nesting bird species of the area. As in "A" local naturalist clubs are to be encouraged to assist in this work.

8.3 Management Strategy "C"

This strategy is designed to permit achievement of the upper limit of the resource production and recreation opportunity targets. As such, it features more intensive management programs and will be more costly to implement than either "A" or "B".

- Access facilities are to be developed as in "B" but will be augmented by a trail to provide greater access around the perimeter of the marsh. A viewing mound will be strategically located so as to be easily accessible from the parking area for handicapped and others. It will provide excellent opportunities for wildlife viewing/nature appreciation. The walking trail is also to be developed within the swamp forest area on the south and east sides of the marsh.

- Water level manipulation to enhance wildlife populations is to be the major focus of management activity. A water control structure including an earth-fill dyke and concrete flow control is to be built. It will facilitate the manipulation of water levels necessary to substantially increase the productivity of food stocks to attract nesting and migrating waterfowl. The program is also expected to provide benefits to the provincially significant bird populations which have used the marsh including black tern, least bittern and sedge wren. The specifications of the water level regime for this program will be carefully calculated so as to ensure protection of the area's ANSI values, especially the wet meadow communities.

  Other marsh management activities and improvements to nesting habitat as described in "B" above are to be implemented as well.

- Fur management is to be more intensively applied. It is anticipated that furbearers especially muskrat, beaver, and mink will be more productive in an intensively managed marsh. Fur harvest is to be more closely monitored and will be tied to the overall management of the marsh and marsh vegetation.

- Hunting is to occur as in "B" with up to six designated hunting stations provided.

- Fishing and fisheries management are to occur as in "B".

- Protection of ANSI values will involve balancing of the effort to increase waterfowl production through water level manipulation with the need to provide for the habitat requirements of the significant vegetation communities and flora. An effective operating plan for the water control structure will be a key element in achieving both objectives. Monitoring will be required to adjust water levels to the optimum for vegetation protection and wildlife production.

9. Footnotes

1. Wetland Evaluation Record (unpublished file report), W. Simkin, S. Purves and M. Ferguson September 16, 1986.

2. Agreement between Her Majesty the Queen in right of Ontario, as represented herein by the Minister of Natural Resources ... and Ducks Unlimited, ... dated June 15, 1988.

3. Agreement between Her Majesty the Queen in right of Ontario, as represented herein by the Minister of Natural Resources ... and Wildlife Habitat Canada, ... dated September 6, 1986.

4. A Co-operative Program For Management of Waterfowl Habitat in Ontario; The Province of Ontario and Ducks Unlimited Canada, Schedule "A" to Agreement dated June 15, 1988, p. 2.

5. A Biological Inventory and Evaluation of Wasaga Beach Provincial Park and Adjacent Natural Areas. D.F. Brunton, 1989. p. 114

6. Northern Lights, Vol. 2, Issue I, January/February 1990. p. 8

7. Information provided on Schedule "B".

8. Schedule A, Landuse.

9. p. 11

10. See footnote #5 p. 107, 108 and 109.

11. Short-billed marsh wren is considered to be Regionally significant by Brunton (p. 93) however this species is listed as Provincially significant in "An Evaluation System for Wetlands of Ontario - South of the Precambrian Shield" (p. 166)

10. References

1. Amendment Number 9 to The Official Plan of the Town of Wasaga Beach. 1986, Ainley and Associates Ltd. Consulting Engineers and Planners.

2. An Evaluation System for Wetlands of Ontario South of the Precambrian Shield, Second Edition. Wildlife Branch, Outdoor Recreation Group, Ontario

3. Brunton, D.F. 1989. A Biological Inventory and Evaluation of Wasaga Beach Provincial Park and Adjacent Natural Areas, Simcoe County, Ontario. Richmond Hill, Ontario Ministry of Natural Resources, Parks and Recreational Areas Section, Central Region.

4. Chapman, L.J. and Putnam, D.F.; The Physiography of Southern Ontario, Third Edition. 1984. Ontario Ministry of Natural Resources, Toronto.

5. Conway, T.A.; Archaeology of The Lower Nottawasaga River 1973, Ontario Ministry of Natural Resources.

6. Environment Canada; Temperature and Precipitation 1941-1970 - Ontario. Atmospheric Environment Service.

7. Hemmerick, G.M. and Kendall, G.R.; Frost Data 1941-1970. 1972. Atmospheric Environment Service, Environment Canada.

8. Hunter, Andrew F.; A History of Simcoe County, 1948. The Historical Committee of Simcoe County, Barrie, Ontario.

9. 1989 Municipal Directory, Ontario Ministry of Municipal Affairs.

10. O'Brien, Roberta M.; Archaeological survey of Wasaga Beach, 1975. Ontario Ministry of Natural Resources, Toronto.

11. Official Plan of the Town of Wasaga Beach, 1978.

12. The Corporation of the Town of Wasaga Beach By-Law Number 75-10.

13. Wetland Data Record, Marl Lake 808 292. 1984. Ontario Ministry of Natural Resources, Huronia District Office - file.

14. Wetland Evaluation Record, Marl Lake, 1984. Ontario Ministry of Natural Resources, Huronia District Office - file.

15. Wetlands Planning Policy Statement - Implementation Guidelines, 1989. Ontario Ministry of Natural Resources, Toronto.